

1       how much of the other? Off the top of my head, I  
2       frankly am not smart enough to know that you can  
3       just throw that open to the market and that somehow  
4       the market would say you know, 50 percent needs to  
5       be licensed and 50 percent needs to be unlicensed  
6       or commons or what have you, which is why I  
7       actually do think that the government has a role to  
8       play there in helping to make that decision.

9               So going forward, is it both? Yeah, I  
10       mean we're not in -- as I've said I tend to be too  
11       practical sometimes, but I think the answer is  
12       certainly both and the government has a role to  
13       figure you know how much is right.

14              MR. FURTH: I'd like to ask if Martin  
15       has any perspective to lend on this from his  
16       experience in the U.K. and then I'd like to throw  
17       it open for a few minutes to the audience if they  
18       have questions on this topic as well.

19              DR. CAVE: Well, essentially we've had  
20       to address this question with even fewer facts than  
21       you have since it's only the past three weeks that  
22       the U.K. government has changed the rule in  
23       relation to unlicensed spectrum to permit the  
24       provision of services to the public rather than  
25       just

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1 self-provision. As a consequence of that, the  
2 demand on unlicensed spectrum has been curtailed.

3 We have, however, been very worried  
4 about the prospect of congestion in the light  
5 particularly of possibly misleading horror stories  
6 that we've heard from this side of the Atlantic.

7 And that has predisposed me personally  
8 to favor the hybrid solution in many cases which  
9 you've identified, which is the use of band  
10 managers, will be able to bid on a competitive  
11 basis for spectrum and then try and pile in as many  
12 possibly low value users as can actually be  
13 accommodated within the band. This is just simply  
14 driven largely by the difficulty of doing the risk  
15 analysis. Clearly, it would be a disaster if whole  
16 swathes of spectrum became effectively sterilized  
17 as a result of congestion and their availability  
18 disappeared.

19 However, there may be certain areas in  
20 which unlicensed spectrum can survive and for that  
21 reason I'd be reluctant to see it abandoned  
22 completely. But my own preference would be to sort  
23 of stick roughly to the line that Tom has  
24 identified and acknowledged that unlicensed  
25 spectrum has a zero price but a competitive

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1 spectrum market can actually produce prices which  
2 are probably pretty close to zero in certain  
3 contexts.

4 MR. FURTH: Questions from the  
5 audience? We've got mikes in the back. Stand up  
6 and identify yourself and direct your question to  
7 us, thank you.

8 MR. REED: Yes. David Reed. Well,  
9 actually more of a comment than a question on the  
10 particular question you raised earlier about how we  
11 might practically decide how to balance between  
12 "unlicensed" or commons, both of which are bad  
13 terms or the inclusive license market approach.  
14 And what I think probably best thought about in  
15 this space is two things, one responding to Martin  
16 Cave's point which is that in fact we have no  
17 congestion. We are so far from congestion in the  
18 spectrum other than by regulatory limits that the  
19 likelihood that we'd have congestion in the next 5  
20 to 10 years, if we freed it all up, is very low  
21 even if they allowed people to use it for terrible  
22 reasons.

23 The practical fact of the matter is  
24 that the old regime, which is neither of these two,  
25 has been the most inefficient of all. As far as

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1 the new types of ideas, these spectrum auctions,  
2 secondary markets, versus the other, I think we  
3 should have a horse race. And I put all my money,  
4 and I think I would recommend to all my investor  
5 friends, to put all my money on the unlicensed  
6 side. But it's fine, a perfectly reasonable  
7 strategy would be to basically have either a  
8 regulatory proceeding or a congressional. I'm not  
9 sure who gets to do it.

10 But it basically says for every new allocation of  
11 spectrum to a new use, half of it goes to auction  
12 and half of it goes to unlicensed, both primary  
13 users. If all the economic value migrates into one  
14 thing or the other, we'll know our answer.

15 If we hobble one of those approaches by  
16 unreasonable rules that basically then we won't  
17 find our answer and I think now is the time to get  
18 the answer.

19 MR. FURTH: Do you want to comment,  
20 David?

21 MR. WYE: Yes. Throughout all these  
22 workshops, one thing that I've noticed is there  
23 seems to be a tendency to kind of if you will tar  
24 one model or the other with kind of the sins of the  
25 past if you will. I am the first to admit that

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1 some of the, we won't say broadcasting -- some of  
2 the broadcasting spectrum probably isn't as  
3 efficiently used as it could be. That doesn't mean  
4 that all licensed spectrum is being used  
5 inefficiently. I actually happen to think that  
6 AT&T Wireless uses its spectrum pretty darn  
7 efficiently.

8 On the other hand, we all recognize  
9 that there are, at least I thought, one of the  
10 things I thought I knew as a truth, and anybody can  
11 correct me if I'm wrong, is that the reason we keep  
12 going kind of from 900 to 2.4 to 5 is because at  
13 least the reports that I've heard or seen in the  
14 press is that it's because the bands keep getting  
15 congested. Now, that's not to say that that can't  
16 be solved through better use of technology. I  
17 think that's maybe what David Reed was just saying.

18  
19 But I just would perhaps offer a  
20 cautionary note that just because we did it wrong  
21 in the past doesn't mean we're going to continue to  
22 do it wrong in the future. And I think that's the  
23 whole point of what this task force is all about is  
24 not to throw the baby out with the bathwater, but  
25 how do we make things better? How do we make the

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1 licensed regime better? How do we make the  
2 unlicensed regime better? How do we make them  
3 better together, and so maybe we could carry that  
4 forward.

5 MR. STEVENSON: Carl Stevenson.  
6 Jennifer asked what I thought was actually a very  
7 good question and that was what happens to the  
8 customer of the unlicensed device where the current  
9 rules say you must accept any interference you  
10 receive from anything else. Period. End of story.

11 And then Mr. Wye's comment also about the apparent  
12 congestion and things that started out in 900 and  
13 went to 2.4 and now are going to 5. I'd like to  
14 make a couple observations on that.

15 First of all, when Part 15 Spread  
16 Spectrum Use first started and IEEE 802 started  
17 developing standards for computer networking, the  
18 environment was very different. The use of these  
19 things has grown to such an extent that we do find  
20 ourselves needing more spectrum. Part of it is a  
21 problem that Mr. Wye seemed to at least allude to  
22 or point to a little bit is that there are no  
23 standards. It's basically a free for all. You  
24 have a mixture of things like cordless phones and  
25 baby monitors and so on and so forth that don't

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1 look out for each other, don't use the spectrum  
2 cooperatively. And this causes a lot of the  
3 interference that does exist in the Part 15 bands.

4 And I would submit that, as I mentioned  
5 the other day, that if the Commission were to take  
6 a look at the National Technology Transfer Act, at  
7 least a very strong encouragement that federal  
8 regulatory agencies take open industry consensus  
9 standards into account. I think we're at the stage  
10 where the 802 standards have become so ubiquitous  
11 and have become so important to society that they  
12 actually have enough public interest value that  
13 they really should have their status in some sense  
14 upgraded so that the users do have a little more of  
15 an expectation of better performance.

16 In terms of technology transfer, all  
17 the way along the line we've retained backward  
18 compatibility. We haven't stranded users. I think  
19 the standards organizations have done a pretty good  
20 job. Some of the problems that we face in the Part  
21 15 bands are due to other systems that aren't  
22 cooperative, that don't work together well. So  
23 some way of dealing with that issue is something  
24 the task force should consider.

25 MR. FURTH: Comments.

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1 MS. WARREN: Yes. I just wanted to  
2 respond to something Carl said which was about  
3 unlicensed perhaps having the need to be able to  
4 afford greater protection to the consumer. I may  
5 be paraphrasing what he said. But I think that  
6 then argues for unlicensed uses to perhaps have  
7 their own unencumbered spectrum rather than sharing  
8 because it's very difficult because while the  
9 manufacturer understands that it is under Part 15,  
10 the consumer doesn't read the last line of the  
11 instruction manual too closely as the gentleman on  
12 session one panel a week or so ago acknowledged.

13 So unless there is some way to fully  
14 notify so that the consumer can't miss it like on  
15 the device that you have no expectations or your  
16 expectations have to be limited with the way this  
17 device operates, it's very difficult for shared use  
18 and there's obviously a proceeding in play right  
19 now that raises that issue directly.

20 MR. FURTH: Ed?

21 MR. EDGAR: I just want to ask the same  
22 question I asked at the unlicensed workshop we had  
23 almost two weeks ago. I'm hearing two conflicting  
24 views here. Cut it open, let it be Darwinian. And  
25 the other one is we need some rules. And I'm

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1 talking about the unlicensed spectrum.

2 My question is, is it broke and we have  
3 to fix it today or are we anticipating problems in  
4 the future?

5 I'd appreciate anybody who wants to  
6 comment on that.

7 And I also have a second question.  
8 Most of the day today has been on unlicensed, which  
9 I've found interesting. And that's fine because if  
10 that's what you want to talk about, by all means  
11 talk about it. But I do have a question about  
12 shared use of spectrum in terms of rights and  
13 responsibilities.

14 What about things that those of you are  
15 familiar with -- the north points of the future.  
16 Or what the responsibilities of incumbents to keep  
17 their technology? Let me put it this way. What  
18 are the obligations, or what should the obligations  
19 of incumbents be to keep their technology current,  
20 either in the unlicensed spectrum or in the  
21 licensed spectrum?

22 MR. FURTH: Comments on that because I  
23 think that's a good segue on where we want to go on  
24 the next sort of section of our discussion,  
25 defining the rights better as David talked about

1 and under both models.

2 Does anybody want to comment on Ed's  
3 questions?

4 MR. HAZLETT: Yes. I think the  
5 assumption is there is an unlicensed model and we  
6 should get the rules right and make sure that  
7 people cooperate. The assumption implicit is there  
8 is a need for coordination. There is a scarcity  
9 problem. You can't interfere. It's costly not to  
10 interfere. There's a need for some coordination,  
11 some protocols and some etiquette and that needs to  
12 be coordinated. That's right, but again the  
13 regulatory model is wrong.

14 That is to say this is a competitive  
15 market function and just suppose, just get crazy  
16 and suppose that the 1996 proposal by Senator  
17 Pressler to issue overlay rights covering the  
18 entire broadcast TV spectrum, 402 megahertz, and  
19 that that proposal had gone through and we had  
20 given out several licenses, 580 megahertz licenses  
21 or some larger number of smaller allocation or  
22 whatever. But you had gotten those licenses with  
23 complete flexibility into the market place, and  
24 they had to respect the incumbent broadcaster  
25 rights, you know, to protect the three or four

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1 American households that don't subscribe to cable  
2 or satellite.

3 The use of all unused, somebody said in  
4 rural areas TV spectrum is slightly underutilized.

5 That's going down as the understatement of the new  
6 century. So these flexible rights competing  
7 against one band manager competing against another,  
8 you could have all kinds of economic activity. It  
9 could see mobile services, very close to what we  
10 have today. You could see fixed wireless  
11 broadband, close to what we see today. You could  
12 see all sorts of stuff is cutting edge. You could  
13 see all sorts of stuff we haven't seen yet.

14 Different rules, different coordination  
15 mechanisms, different architectures certainly could  
16 be proposed. And that's the trial and error you  
17 want. You want these competitors in the market  
18 place to be able to offer their various solutions.

19 In general, those will be shared solutions if you  
20 want to speak in those terms, but just as cellular  
21 and PCS systems are shared systems. But you will  
22 have an opportunity to actually have competitive  
23 rivalry between these solutions and the consumer  
24 interests are clearly on the side of that rivalry.

25 If you're at the target and you're

1 walking down the aisle with a telephone and you  
2 think that the FCC is giving you this compatibility  
3 of everything at 900 megahertz, you're in the wrong  
4 aisle. Go over to the software aisle. There's no  
5 FCC to protect you on software and there's lots of  
6 compatibilities and by the way there's lots of  
7 incompatibilities. But that's a better market.  
8 It's much more progressive, lots more innovation,  
9 and lots more great, new stuff and lots more  
10 welfare created for society because of the dynamics  
11 of that process, despite the fact there is a cost  
12 associated with being stranded on an eight-track  
13 stereo tape or a Commodore computer.

14 MR. CALABRESE: I think to some degree  
15 the answer to both of Ed's questions can be  
16 informed by remembering, and I just want to  
17 reiterate what I said earlier the distinction  
18 between the two types of unlicensed technology that  
19 we're talking about. You know, today's 802.11 type  
20 technology which is channelized and the future of  
21 unlicensed, which is going to stretch out all  
22 across the spectrum across both licensed and  
23 unlicensed bands on an underlay basis.

24 And so the Commission's unlicensed  
25 policy making needs to proceed on two very

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1 different, but parallel tracks, with respect to  
2 that. And I think that in both cases we will need  
3 rules. There is an ongoing role for the  
4 Commission, but the rules are of a very different  
5 type than the licensing. So for example, when  
6 Martin talks about licensing a band manager for  
7 unlicensed devices, that is probably totally  
8 unnecessary. Imagine if we did that on the  
9 internet, if we had a bandwidth manager for the  
10 internet. I mean why not instead you know have  
11 open protocols and etiquettes and so you have  
12 compliance-like, compliance licensing for devices  
13 that can share that space.

14 And you know, the same thing would  
15 probably be true with respect to the underlays.  
16 And then on the second question concerning  
17 interference standards, Dale Hatfield, I know, has  
18 been blue in the face talking about the need to  
19 regulate receiver standards because interference,  
20 if we allow these fragile old dumb devices to lock  
21 up the spectrum, it's really standing in the way of  
22 innovation and efficiency.

23 And so what we need to do, and that's  
24 one of the main reasons against any permanent,  
25 vested interest in frequencies because the

1 Commission will need to continue a role in evolving  
2 the interference standard. And I think we're going  
3 to go to talk about that.

4 But it's very important, if we're going  
5 to redefine license rights, as a bundle that on one  
6 hand has complete service flexibility, but on the  
7 other hand limits interference both in terms of  
8 what you can impose and what you must receive, then  
9 that standard, that interference standard has to  
10 evolve with technology. You can't just say these  
11 are your fee simple property rights forever and  
12 leave it at that.

13 MS. FARQUHAR: I think we've already  
14 segued into the second part of our panel and so let  
15 me pick up there with respect to defining basic  
16 spectrum usage rights and where Ed started and  
17 where Michael just picked up in particular.

18 Our frequent criticism is that noted of  
19 spectrum usage rights is that they're not clearly  
20 defined by the FCC's rules right now. So one part  
21 of the question is in what sense are they imprecise  
22 or not clear at how or why does that need to be  
23 fixed? And also, should there be time limits or  
24 term limits if government, for instance, does  
25 address these issues and set some limitations?

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1 Should we recognize that technology evolves?  
2 Should there be an indefinite period of time for  
3 which say 5 or 10 years for which these rules are  
4 effective and then you automatically revisit it?  
5 Do term limitations or something else? Or should  
6 there be some other mechanism to revisit this over  
7 time?

8 Let me start with Martin to give him a  
9 chance to think about this and then we'll take  
10 comments from others at the table.

11 DR. CAVE: Naturally, these are the  
12 questions we had to address as well in writing the  
13 report and let me focus particularly on the  
14 duration question because I think that's really  
15 quite difficult. In essence, the conclusion we  
16 came to was that you could either adopt a band  
17 specific policy which would, in essence, mean that  
18 you would have to look at each band and decide how  
19 the technology was going to change and adjust the  
20 duration on the basis of that.

21 But as we know, that's a pretty fragile  
22 basis upon which to base decision making because we  
23 don't know how the technologies are actually going  
24 to develop. So in conclusion I think we came to  
25 the view that it was probably best to have infinite

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1 duration and licenses but with some kind of reserve  
2 power for the government's compulsorily to purchase  
3 the licenses at some kind of market evaluation  
4 where that was necessary, if the system which I've  
5 described appeared to generate particularly severe  
6 market failures and strategic behavior. But we  
7 were still a bit unhappy with that because nobody  
8 wants to give governments or regulators the powers  
9 to remove other people's property compulsorily.

10 So I think this is a very open question  
11 and really is one for the purposes of my report we  
12 sort of handed on to the next line of people who  
13 are going to have to frame the legislation.

14 MS. FARQUHAR: Joe?

15 MR. GATTUSO: I'd like to comment on  
16 this. It seems to me in listening to the other  
17 workshop sessions and also in knowing about  
18 spectrum management generally, sometimes I wonder  
19 if we have advanced to a point over the last 70 or  
20 80 years of having radio where we think we know the  
21 rights to a certain point and we make decisions in  
22 spectrum management thinking we know a certain  
23 amount about rights and responsibilities, but we  
24 have a lot of uncertainty back a step that we would  
25 not tolerate in other areas.

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1           The analogies in spectrum management  
2 come fast and furious. You've always got the  
3 property rights analogy, the real property. But  
4 you can have intangible rights analogies. You have  
5 the highway analogies. In every one of those  
6 cases, I think of okay, I believe in analogies so  
7 I'll throw out some. You think about are there  
8 certain principles that have developed in terms of  
9 real property you've had six, seven hundred years  
10 of development where it's already established in  
11 law, certain things are established. In real  
12 property you've got title. I've mentioned that  
13 before.

14           You've got a certain sense that as a  
15 general principle a purchaser of a right would have  
16 a certain rights for -- they fall into certain  
17 classifications and there are certain things under  
18 those classifications you can do. There's a  
19 developed body of law with respect to newcomers  
20 versus existing users of the rights and you have  
21 both time and you have nuisance law. And I think  
22 of the equivalent in spectrum and it's like not  
23 knowing if you're getting an oil and gas lease how  
24 long it's going to last or what does it mean when  
25 you have an oil and gas right. Well, we know that

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1 in oil and gas. And it means like if you want to  
2 use the highway example, we know that as a general  
3 principle everywhere in the United States that a  
4 car entering in the highway, its wheels are already  
5 on the highway. We know that.

6 But it seems that we are constantly  
7 debating and through the analogies very simple  
8 things like who owns the spectrum? One person says  
9 there's no ownership. True. The other person says  
10 well the analogy goes a certain way. We haven't  
11 established that. We're asking a basic question --  
12 how long does the right last? Well, you can argue  
13 that some ways given practice since the Federal  
14 Radio Commission and given court decisions and  
15 broadcasting elsewhere, the right does continue  
16 indefinitely in certain areas.

17 Real question is should it or not and  
18 that's why I think Martin Cave had the difficult  
19 analysis of saying well, which is better? Do you  
20 want something -- do you want the ability to go  
21 back and revisit that and do you institutionalize  
22 that or do you have a system where that's there?  
23 So I think that these fundamental questions should  
24 be addressed and there are especially with usage  
25 certain things with respect to what the party

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1 holds, what incumbents hold, and what they're  
2 allowed to do with those secondarily.

3 MS. FARQUHAR: Comments from the people  
4 in the panel?

5 Mike?

6 MR. KURTIS: I think the current model  
7 that you have in CMRS is an indication of how this  
8 can work properly. There is an expectation of a  
9 license renewal that is subject to being taken away  
10 if you haven't met certain standards. You know,  
11 you don't want to be in a situation where the  
12 person who holds the license in a particular  
13 technology especially like CMRS that requires a lot  
14 of time and a lot of money to deploy, that that  
15 license does not have an ongoing expectation of  
16 being able to renew. That's an absolute way to cut  
17 off all capital available for building a costly,  
18 complicated expensive network.

19 But you do maintain at the Commission a  
20 safeguard from that spectrum lying fallow or not  
21 being properly used in methods that have  
22 construction requirements at the end of that  
23 period. Other people can come in and take over and  
24 apply for licenses that have not been properly used  
25 if the carrier is not acting appropriately,

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1 although there was an expectation of renewal, it's  
2 not an absolute right. But to the extent that the  
3 carriers are doing the right thing, there has to be  
4 the expectation that their license is going to be  
5 continued, if you want to be able to get full use  
6 of that spectrum.

7 MS. FARQUHAR: That's a good point with  
8 respect to -- and please, chime in and raise this  
9 issue too. Jennifer mentioned earlier consumers  
10 expectations with respect to devices, products.  
11 Michael just noted that expectations of the capital  
12 market and investors. Are there other expectations  
13 out there that fall into this realm when you think  
14 about it as well?

15 David?

16 MR. WYE: Yes. Obviously, I would tend  
17 to agree with Michael on that. My company spends  
18 billions of dollars building out its licenses.  
19 This year alone we'll spend over five billion  
20 dollars trying to improve our coverage and our  
21 capacity and everything else. If I think that in  
22 three years that's going to go away, why would I  
23 ever spend that money? And although I agree  
24 theoretically that you know the licenses have a  
25 renewal expectancy, I certainly believe that they

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1       should. I think one thing that has not perhaps  
2       been one of the Commission's shining moments in the  
3       past is that when licensees have not lived up to  
4       their obligations, they have not taken the licenses  
5       back.

6               And I think if we're going to make this  
7       system work, and I think it works well now, the  
8       Commission has got to stand up and say you're not  
9       using it, I'm taking it back. I know that AT&T  
10      Wireless has turned licenses back in because we're  
11      not able to meet the requirements of the terms of  
12      the license. And that should be an absolute mantra  
13      at the Commission is enforcement. We're back to  
14      enforcement again. It's not that the system is  
15      necessarily broken and we have to change the terms  
16      of the licenses, we simply need to enforce the  
17      system that we have in place now.

18             MS. FARQUHAR: Jennifer?

19             MS. WARREN: I just want to add one  
20      even though I said I wouldn't come at this from a  
21      satellite perspective. You have to apply again the  
22      principle of practicality to go back to what Peter  
23      Pitsch said earlier. Even if you were looking at  
24      limiting time frames for licenses, if throwing out  
25      a five year time period, you don't even have the

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1 satellite launched then. So I mean there are very  
2 different expectations by industry as well as to  
3 the terms and the means to satisfy the terms of the  
4 licenses and I think that has to be taken into  
5 account.

6 And I would also say the enforcement  
7 issue is an important one from the satellite  
8 perspective and we started to see that from our  
9 arena and it's healthy, painful but healthy, and we  
10 would encourage the Commission to keep doing that.

11

12 MS. FARQUHAR: To what extent -- I'm  
13 sorry.

14 MR. CALABRESE: I just want to make  
15 point in this discussion is I hope we're not  
16 leaving the impression though that there's a kind  
17 of, I guess, I would call a false dichotomy between  
18 some of these. Because, for example, renewal  
19 expectancy is not, I don't believe is contradictory  
20 to limited term licensing because you can have what  
21 we do today, right? You're saying in PCS a limited  
22 term license with renewal expectancy, the question  
23 is kind of on what terms, how we do that.  
24 Similarly, with interference you can renewal  
25 expectancy, limited term licenses and still have

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1 the Commission migrate the interference standard  
2 along with technology over decades. So none of  
3 those things are in terms of assembling a bundle of  
4 rights, I don't think any of those three things are  
5 in contradiction, although they may be in some  
6 tension. And that's one reason too in response to  
7 David's point about internalizing the opportunity  
8 cost of spectrum.

9 Again, rather than relying on the  
10 Commission to have to yank spectrum back, if we  
11 move to a more flexible market oriented allocation  
12 policy using a price mechanism, then those sort of  
13 market base incentives for efficiency should be  
14 built right in. The problem is though we have  
15 commercial users who are not on a level playing  
16 field. Many like AT&T Wireless and so on who pay  
17 for their spectrum and others who haven't. That's  
18 why earlier at the very outset I was mentioning  
19 that if we are going to create this new type of  
20 license with this valuable service and market  
21 flexibility, when we assign these new licenses that  
22 we ought to perhaps take advantage of moving to a  
23 kind of annual user fee for spectrum use because  
24 that can serve several important objectives that  
25 are in the statute. It can recover to the public

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1 an ongoing and market based return on the public  
2 resource, internalize these opportunity costs for  
3 efficiency. It can reduce, and I think it's an  
4 important flaw with the current auction system is  
5 these are sort of viewed, the companies are forced  
6 to view these and it's even worse in Europe. But  
7 they're forced to view these as one off auctions,  
8 where you're sort of bidding to have control of  
9 this resource for all time. I say worse in Europe  
10 because they were actually licensing, it's like a  
11 business license. Even if you owned first or  
12 second generation license you couldn't do 3G unless  
13 you went into this auction and paid more money.

14 So it would reduce barriers to entry to  
15 whether we use competitive assignment in entry or  
16 not, do it just for the first term. And then after  
17 upon renewal give the incumbent either now or these  
18 incumbents who get the spectrum through auction,  
19 give them the option if they want these valuable  
20 flexibility rights, then they can just convert to  
21 an annual rental fee system. And that can be  
22 based, imputed, based on a modest percentage of the  
23 value that's evidenced by the secondary market  
24 transactions.

25 MR. MILLER: I'd like to quickly

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1 comment. I like hearing your user fee proposal  
2 because the LMCC discussed this and even I think  
3 proposed it many years ago. And the reason is with  
4 auctions one thing I think a lot of people don't  
5 look at is even economically they're not really  
6 that good because the government gets the money  
7 today and then as the winner builds out his system,  
8 he deducts the auction price and his operating cost  
9 so five years down the road when government  
10 expenses are much higher, government revenues  
11 suffer because they got all the money today instead  
12 of being spread over the years by your user fee.  
13 So I like that concept.

14 I'd like to address the question that  
15 didn't get answered about what incentive is there  
16 for incumbents to use more spectral efficient  
17 equipment. For commercial users, this whole  
18 conversation seems to be dominated by commercial  
19 and what we call private radio users and there is  
20 an economic incentive for governmental users, there  
21 really isn't an economic incent. There's an  
22 economic disincentive since they have existing  
23 infrastructure they pay millions of dollars for tax  
24 revenues that are down.

25 The FCC tried to address the congestion

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